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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DICKEY, THOMAS L

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 01/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/925,214

Applicant(s)

MOISE ET AL.

Examiner

Thomas L Dickey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 27 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 35-70 is/are pending in the application.
- 4a) Of the above claim(s) 42-52 and 60-70 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-38, 53-56 is/are rejected.
- 7) ☒ Claim(s) 39-41 and 57-59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s): _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. The amendment filed on November 27, 2002 has been entered.

Election/Restriction

2. On November 27, 2002, Applicant cancelled claims 1-34 and presented new claims 35-70. Per telephone conversation 1/6/03 it is agreed that Applicant intended to write that new claims 35 and 53 are generic, claims 36-41 and 54-59 read on embodiment I (figure 1 with first and second metallic layers formed above the ferroelectric layer and oversized vias in the ferroelectric layer), claims 42-46 and 60-64 read on embodiment V, figure 5, claims 47-52 and 65-70 read on embodiment III, figure 3, claims 47-49 and 65-67 read on embodiment II, figure 2, and claims 36-38 and ⁵¹⁻~~6~~-56 read on embodiment IV, figure 4. It is further agreed that Applicant has elected, without traverse, generic claims 35 and 53, and claims 36-41 and 54-59, reading on embodiment I.

Oath/Declaration

3. The oath/declaration filed on August 8, 2001 is acceptable.

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Drawings

4. The formal drawings filed on August 8, 2001 are acceptable.

Priority

5. Applicants have made no claim for priority.

Information Disclosure Statement

6. The Information Disclosure Statement filed on August 8, 2001 has been considered.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 35-37 and 53-55 are rejected under 35 U.S.C. 102(b) as being anticipated by MOCHIZUKI et al. (5,990,507).

Mochizuki et al. discloses an integrated circuit with a transistor level comprising one or more semiconductor devices S-D-G disposed over a substrate 1 and an overlying transistor isolation layer 10 having one or more contact vias 34 extending there through; a ferroelectric structure, positioned over the transistor isolation layer 10, the ferroelectric structure including a ferroelectric device level 122 and overlying ferroelectric isolation layer 13 having one or more vias 134 extending there through, a first metal layer 22, and an inter-level dielectric level 30; and a second metal level 38, BL disposed over the inter-level dielectric level 30, wherein the first metal layer 22 is formed over the ferroelectric device level 122, the ferroelectric device level 122 includes one or more ferroelectric capacitors 17-18-19, and the inter-level dielectric level 30 is disposed over the first metal layer 22, and the contact vias 34 are filled with tungsten contact plugs, and a method of forming the same, comprising forming a transistor level comprising one or more semiconductor devices S-D-G disposed over a substrate 1 and an overlying transistor isolation layer 10 having one or more contact vias 34 extending there through; forming a ferroelectric structure, positioned over the transistor isolation layer 10, the ferroelectric structure including a ferroelectric device level 122 and overlying ferroelectric isolation layer 13 having one or more vias 134 extending there through, a first metal layer 22, and an inter-level

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dielectric level 30; and forming a second metal level 38,BL over the ferroelectric device level 122, wherein the first metal layer 22 is formed over the ferroelectric device level 122, the ferroelectric device level 122 includes one or more ferroelectric capacitors 17-18-19, and the contact vias 34 are filled with tungsten contact plugs.

Note figure 20 and column 18 lines 50-54 of Mochizuki et al.

Claims 35,36,53, and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by KANAYA et al. (20020063274 A1).

Kanaya et al. discloses an integrated circuit with a transistor level comprising one or more semiconductor devices 12-13-14 disposed over a substrate 1 and an overlying transistor isolation layer 2a having one or more contact vias 17 extending there through; a ferroelectric structure, positioned over the transistor isolation layer 2a, the ferroelectric structure including a ferroelectric device level 2b and overlying ferroelectric isolation layer 21 having one or more vias extending there through, a first metal layer 22, and an inter-level dielectric level 23 and a second metal level 24 disposed over the inter-level dielectric level 23, wherein the first metal layer 22 is formed over the ferroelectric device level 2b, the ferroelectric device level 2b includes one or more ferroelectric capacitors 20, and the inter-level dielectric level 23 is disposed over the first metal layer 22, and a method of forming the same, comprising the steps of forming a transistor level comprising one or more semiconductor devices 12-13-14 disposed over a substrate 1 and an overlying

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transistor isolation layer 2a having one or more contact vias 17 extending there through; forming a ferroelectric structure, positioned over the transistor isolation layer 2a, the ferroelectric structure including a ferroelectric device level 2b and overlying ferroelectric isolation layer 21 having one or more vias extending there through, a first metal layer 22, and an inter-level dielectric level 23; and forming a second metal level 24 over the ferroelectric device level 2b, wherein the first metal layer 22 is formed over the ferroelectric device level 2b and the ferroelectric device level 2b includes one or more ferroelectric capacitors 20. Note figure 4C of Kanaya et al.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 38 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over MOCHIZUKI et al. (5,990,507) in view of KANAYA et al. (20020063274 A1).

Mochizuki et al. discloses an integrated circuit, and a method of forming the same, with all limitations of claims 38 and 56, including tungsten contact plugs,

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except that the ferroelectric capacitors are formed over the tungsten contact plugs.

Note figure 20 and column 18 lines 50-54 of Mochizuki et al.

However, Kanaya et al. discloses an integrated circuit with ferroelectric capacitors 20 formed over respective metal contact plugs 17. Note figure 4C of Kanaya et al. Therefore, it would have been obvious to a person having skill in the art to replace the offset ferroelectric capacitors of Mochizuki et al.'s integrated circuit, and method of forming the same, with the ferroelectric capacitors are formed over respective contact plugs such as taught by Kanaya et al. in order to use the same net surface area of the chip for the contact plugs to thus provide allow more FeRAM cells to be formed on the same sized chip..

Allowable Subject Matter

9. Claims 39-41 and 57-59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 703-308-0980. The examiner can normally be reached on Mon-Thu 8-6. Any inquiry

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concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 703-308-0980. The examiner can normally be reached on Mon-Thu 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TLD
01/2003

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